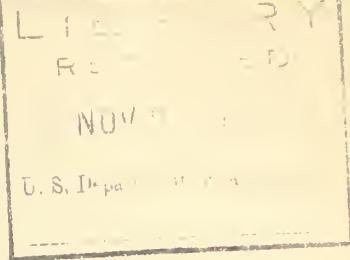


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## THE PRUNE INDUSTRY IN YUGOSLAVIA

by

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A Preliminary Report

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## THE PRUNE INDUSTRY IN YUGOSLAVIA

By M. J. Newhouse, Specialist in Dried Fruit Marketing a/

### Summary and Conclusions

The primary object of prune production in Yugoslavia is to supply the native population with fresh fruit, prune jam and prune brandy. Under normal conditions only such quantities of prunes as are left over after these needs have been taken care of are dried and sold in the export market. The quantities of prunes used for each purpose depend largely on prices ruling for prune by-products but in general the production of dried prunes is entirely secondary to the other aspects of the prune industry.

Prune production cannot be said to be a specialized industry in Yugoslavia. Commercial orchards are very rare, practically all of the trees being found in the groves surrounding the homestead. As the farmers generally live together in small villages the concentration of prune trees in the vicinity of the villages is sometimes very heavy. The population of the country is mainly rural, farm life in general being relatively simple and self sufficing. Modern horticultural methods are practically unknown.

Tree losses in Yugoslavia have run into the million in recent years due to lack of care and planting during the war and to the spread of Schildlaus (Lecanium Corni) in the older orchards. Moreover, production per tree in recent years has been low due to unfavorable climatic conditions. The Kingdom is much concerned over the plight of the industry. Funds, however, are to be made available for disease and pest control measures and much additional educational work is contemplated. State nurseries are maintained by the provinces (Oblasts), and each county in the provinces has an agricultural agent. Through these and through extension schools in horticulture the Yugoslav government is attempting to improve varieties and to introduce modern methods of planting, cultivation, drying and harvesting.

In pre-war years exports of dried prunes from Yugoslavia averaged about 50,000 short tons annually. Post-war exports up to 1927 did not vary materially, except in the low crop year of 1924, from the pre-war average. For the crop years 1927, 1928, and 1929, however, the annual exports have averaged less than 25,000 tons. This decline in the export surplus of dried prunes is the result partly of tree losses and partly of reduced yields per tree. Contributing causes are the greater conversion of plums into jams and brandy and increased shipments of fresh plums

a/ The report is based on actual observations and on interviews with growers, packers, sales factors, bankers, agricultural agents and government officials in Yugoslavia, by Mr. Newhouse in company with L. V. Steere, Agricultural Commissioner at Berlin. Mr. Newhouse represented the Division of Cooperative Marketing which on October 1 was transferred to the Federal Farm Board.

due to the unfavorable prices ruling on dried prunes in recent years. Fresh prune exports show a notable increasing tendency. Improved methods of packing and shipping and the construction of standard gauge railways into the prune area are largely responsible for this increase.

Germany is still the most important export market for Yugoslav dried prunes. Expansion of the more near-by markets such as Czecho-slovakia, Austria, Hungary and Italy has been encouraged in recent years. While smaller production totals in Yugoslavia have made the markets of western Europe less necessary it must also be borne in mind that the availability of large quantities of reasonably priced, good quality prunes from the Pacific Coast have made the markets of northwestern Europe less reliant on Yugoslav prunes. In spite of numerous government rules and regulations there has been much complaint in exports markets on the quality of the Yugoslav prune. Extremely dry summers, the drain upon tree vitality as a result of the scale and the shipment of the prunes in bags to distant points for water and steam processing, are given as responsible for this condition.

In view of the considerable reduction in the Yugoslav export surplus of dried prunes in recent years it becomes of importance to ascertain, first, whether the Yugoslav industry can overcome the difficulties with which it is at present confronted or whether it must ultimately disappear; and, second whether the inauguration of an official rehabilitation program may make it possible to produce a prune of better quality and size which, under the existing lower production costs, might become a serious competitor with the Pacific Coast prune in European markets.

Relative to the first point, certain well defined conditions in the Yugoslav prune industry indicate that the industry will neither continue to decline nor remain at its present low level. Plums in that country are grown primarily to supply an essential national beverage, prune brandy. The production of plums, therefore, will continue unless substitute sources for brandy are developed or restrictions are placed on the use of alcoholic beverages. The possibility of either of these developments taking place is very remote. Grain alcohol has been used occasionally as a substitute for prune brandy but only in years of low crops. Part of the crop losses in recent years have been due to unfavorable climatic conditions which may or may not occur again for many years.

It can be said with a fair degree of certainty that the Yugoslav peasants will not only continue producing prunes but will show a renewed interest in production whenever the world supply and demand situation results in higher prices. Furthermore, the packing and export end of the industry has a relatively heavy investment in buildings, equipment, and personnel trained in export selling. The packing and export industries as well as the government are giving every encouragement to the maintenance and development of the industry..

Relative to the second point, pertaining to the production of a prune more competitive in size and quality, two essentially different viewpoints are involved. The packers, the exporters and the government, advocate a larger and better prune to be secured by the introduction of grafted varieties and by adequate educational and police control measures. Opposed to this viewpoint is that of the peasants who think first in terms of prunes for brandy, for which the prevailing small, native, seedling fruit is best. Export requirements are entirely secondary to the peasant. The commonly used home-made and inexpensive drier, though inadequate for turning out quality fruit, is entirely satisfactory to the peasant for drying his surplus prunes after the brandy requirements have been taken care of.

This difference in viewpoint has made progress in Yugoslav prune production exceedingly slow. Strenuous efforts are being made to modernize the industry but it is questionable whether the peasant, with his present experience and training, is capable of assuming such responsibilities. Government regulations have not produced desired results. A study of the needs of import countries from the standpoint of consumer preferences and consuming trends, of special fruit needs, of seasons and arrival of fruits in import countries, might disclose more desirable outlets for fruit in the fresh state rather than attempting to compete in dried prunes with the United States, which apparently has an advantage over Yugoslavia in its mass production, modern methods and good quality.

An important consideration related to the future of the industry in Yugoslavia is the fact that the sale of dried prunes constitutes the most important source of cash income for many of the peasants. Moreover, since the areas occupied by the prune trees are generally a part of the homestead and are often pastured or intercropped, the industry is not felt to occupy land that might be more valuable for other purposes. The cash investment in the prune growing and drying industry is practically negligible. The industry is extremely elastic because planting costs are low and the native seedling variety comes into bearing quickly. Peasants are inclined to view tree losses lightly and less in the light of a disaster than as a means of securing a young and vigorous orchard, particularly since abundant new stock is available in the peasant's own hedgerows or in the nurseries at very little, or no cost.

While the scale has been very destructive in the older orchards, many new orchards are showing vigorous growth. There is some doubt as to whether new plantings are keeping pace with tree mortality but there is sufficient land in the low foothills, with good exposure and suitable soil, to maintain an important industry if new plantings are encouraged. The scale which is now doing so much damage is not difficult to combat and if new plantings are given sufficient space and are not pruned too high, they need not suffer the fate of the old orchards.

The loss to Yugoslavia of many of its former export markets is not necessarily permanent. There has been developed in many countries, over many years, a real consumer demand for its prunes. With a return of a more normal price relationship between Yugoslav and American prunes, the small but reasonably priced Yugoslav fruit, if of good quality, will readily regain its place. For the immediate future, it is probable that production will continue to be lower than in the years prior to and immediately following the war. The prunes grown may be expected to remain largely of the small native type with some improvement in quality as more modern driers are installed. It is idle to assume that efforts to introduce larger fruit will not have some results, but a new generation of horticulturally trained peasants will have to appear before the results in this respect will be pronounced.

Place of Yugoslavia in World Prune Production

The following table, giving an estimate of the world's commercial production of dried prunes, shows that Yugoslavia ranks next to the United States as the most important producer. Since practically all of the dried prunes produced in Yugoslavia are exported, the exports have been taken as a measure of the commercial crop. The bulk of these exports go to Germany, Czechoslovakia, Italy, Austria and Hungary. They come in competition with prunes from the United States, particularly in Germany, the most important export market for both Yugoslav and American prunes.

DRIED PRUNES: Estimated world's production, 1922 to 1929

Crop	California	Pacific	Yugoslav	France	South	Estimated
of production	northwest	exports	production	production	Africa	world's
	production	Sept-Aug			production	production
	Short tons					
1922	110,000	40,750	56,000	2,357	656	209,763
1923	130,000	30,000	63,000	29,817	1,467	253,784
1924	139,000	19,358	5,000	9,310	1,232	173,900
1925	146,000	12,958	48,000	4,609	677	212,244
1926	150,000	40,500	52,000	6,696	1,051	250,247
1927	225,000	19,500	34,000	20,556	a/ 296	299,352
1928	220,300	2,750	20,500	2,254	b/	c/245,804
1929	a/108,000	a/ 32,500	a/ 12,000	a/ 5,000	b/	c/157,500

a/ Subject to revision. b/ Not available. c/ Exclusive of South Africa.

Features of Yugoslavia

The Kingdom of Yugoslavia was established at the close of the World War. It was built up by uniting to the former Kingdom of Serbia as a nucleus, the principality of Montenegro, several former provinces and subject States of the old Austro-Hungarian Empire, and certain parts of western Bulgaria. It is bounded on the north by Austria and Hungary, on the east

by Roumania and Bulgaria, on the south by Greece and Albania, and on the west by the Adriatic and Italy. Its position is advantageous since some of the most important land and water routes connecting western Europe with the Far East pass through the country. The large prune export markets of central and northwestern Europe lie at the very doors of the country and are readily accessible by water and increasingly by rail routes.

#### Topography, climate and population

Yugoslavia is mainly mountainous and hilly but a great plain, the Pannonian, formed by the Save and Danube rivers, lies in the northeastern part of the country. Drainage in general is away from the Adriatic and flows inland towards the Danube. The most important prune areas in the Kingdom are found in this part of the country. The country is about 97,000 square miles in area, or slightly larger than the combined areas of New York and Pennsylvania. The climate in Yugoslavia is characterized by the absence of spring and autumn, winters and summers succeeding each other abruptly. Summer lasts from May to October with the vales extremely hot and the highlands cool and damp. Winters are often bitterly cold.

The population of Yugoslavia is approximately thirteen million, 85 per cent of which is rural. The two important prune producing areas of Serbia and Bosnia have about 4,000,000 and 2,700,000 people respectively. The rural people live in villages, the isolated farm being rare. Farms are small, averaging from 10 to 20 acres in Serbia. Life in general is extremely simple and cash needs are few. Farm implements are primitive and practically all home-made.

Practically all of the food used by the family is raised on the farms and the women spin the yarn and weave the clothing. Oxen are used largely for draft purposes in Serbia but horses are common in Bosnia. Roads in Bosnia are much better than in Serbia due to the austrian influence in Bosnia before the war. Automobiles in general are a rare sight in the rural districts. According to the 1921 census only 48.5 per cent of the people were able to read and write. The literacy of the population is an important factor in educating the prune growers through the printed word in improved methods of cultivating, drying and marketing.

#### Position of Prunes in the Yugoslav Economy

Prune production is of relatively minor importance in the agriculture of Yugoslavia. The production of cereals is the main agricultural pursuit of the Kingdom, the area devoted to these crops in 1927-28 amounting to 13,000,000 acres, mostly corn, wheat, barley, oats and rye in the order mentioned. The production of livestock ranks next in importance in the agriculture of Yugoslavia. The area devoted to orchards, including plums, apples, pears, cherries, figs, olives, walnuts and all other tree fruit and nut crops, was placed at only 625,000 acres in 1927-28. The total number of trees of all fruits and nuts on this area in 1927-28 was 76,511,000 of which 49,222,000 consisted of plum trees. No separate statistics are available for the areas devoted to the individual fruits and nuts.

Prunes are likewise of only minor importance in the export trade of the country. Total exports of all commodities from Yugoslavia during the four years 1925-1928 averaged \$129,358,000 annually. Construction wood was the most important item in the trade during this period, exports under that heading having averaged \$17,459,000 annually. Exports of corn, however, ran a close second, having averaged \$16,371,000 annually. Eggs, wheat, cattle, hogs and fresh meat, in the order named, were the next most important agricultural exports. Exports of dried prunes during these four years averaged only \$3,104,000 in value or slightly more than 2 per cent of the total annually. In the preceding four years, however, dried prune exports averaged \$3,363,000 annually or about 4 per cent of the total.

The following table gives the average annual value of the principal exports from Yugoslavia during the four years 1921-1924 and 1925-1928.

YUGOSLAVIA: Value of principal exports, average 1921-1924 and 1925-1928

Commodity	Average		Average	
	value	Percentage	value	Percentage
	1921-1924		1925-1928	
	1,000	Per cent	1,000	Per cent
	dollars		dollars	
	:	:	:	:
Construction wood ....	13,583	15.2	17,459	13.4
Corn .....	4,861	5.4	16,371	12.7
Eggs .....	6,106	6.8	9,607	7.4
Wheat .....	5,031	5.6	8,545	6.6
Cattle .....	8,156	9.1	6,170	4.8
Hogs .....	4,339	4.8	5,707	4.4
Fresh meat .....	5,150	5.8	4,834	3.7
Crude copper .....	2,578	2.9	4,598	3.6
Hops .....	907	1.0	3,823	3.0
	:	:	:	:
Dried prunes .....	3,363	3.8	3,104	2.4
	:	:	:	:
Cement .....	1,715	1.9	2,403	1.9
Small stock .....	977	1.1	1,953	1.5
Firewood .....	1,359	1.5	1,829	1.4
	:	:	:	:
Fresh fruit .....	628	0.7	1,622	1.3
	:	:	:	:
All others .....	30,865	34.4	41,328	31.9
Total .....	89,618	100.0	129,358	100.0

Compiled in the Foreign Section of the Division of Statistical and Historical Research from "Statistique du Commerce Exterieur" of Yugoslavia.

### Production and Exports of Fruit Other than Prunes

A large number of fruits, including plums, apples, pears, cherries, peaches, apricots, currants, quince, oranges, figs and dates, are grown in Yugoslavia but prunes are by far the most important. Out of the total number of 73,511,000 fruit trees in 1927-28, plum trees constituted 67 per cent. The next most important were apples with only 10 per cent of the total number of trees. Considerable attention is now being devoted by the government to the expansion of fruit production other than plums, with particular reference to the export market.

The following table gives the exports of fresh and dried fruits other than plums from Yugoslavia during the years 1920 to 1928:

#### YUGOSLAVIA: Exports of fruits other than plums and prunes

Year	Fresh fruits				Dried fruits				Walnuts in the shell
	Apples	Pears	Cherries	Grapes	Apples	and Cherries	pears		
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	
1920	9,388,265	34,361	a/	56,632	b/ 22,460	a/	3,135,607		
1921	4,975,255	171,410	32,203	398,947	2,074,852	1,870,215	3,035,335		
1922	1,519,545	783,503	20,042	284,184	1,410,151	267,076	1,585,476		
1923	24,768,229	448,411	119,256	724,584	1,116,092	1,027,537	2,581,721		
1924	11,796,078	284,098	110,717	188,641	1,034,226	975,692	6,615,458		
1925	28,842,936	609,087	72,084	231,829	a/	1,432,860	574,334		
1926	48,287,160	899,413	109,198	572,063	610,124	1,363,590	5,460,510		
1927	34,459,474	1,548,546	723,177	3,003,578	1,931,931	2,086,753	12,928,015		
1928	22,237,247	3,240,559	1,047,428	2,521,669	3,263,717	1,290,284	6,430,426		

Statistique du Commerce Exterieur du Royaume des Serbes, Croates et Slovenes.

a/ Not given separately. b/ Pears only, apples not given separately.

#### Distribution of Prune Producing Areas

##### Bosnian and Serbian districts

The Yugoslav commercial prune growing areas may be divided roughly into two districts, the Serbian and the Bosnian. The producing areas are found mainly in a region bisected by the Drina river running from the south to the north and flowing into the Save river. Serbia is on the east side of the Drina and Bosnia on the west. The Save river, running from the west to the east and flowing into the Danube at Belgrade, roughly bounds the Bosnia and Serbian prune growing areas on the north. No definite

statistics for a series of years are available but it is estimated that Bosnia produces about one-third of the total crop and Serbia about two-thirds. The best prune producing areas are found in the gently rolling foothills where air drainage is assured. The prune trees show less vigor and are more subject to mosses and lichens in the higher altitudes than in the lower areas. In trade circles the term "Bosnian" often includes all prunes from the Balkan areas.

The most important prune districts in Serbia are around Sabacar, Loznicaer, Valjevoer, Cacaker, Milanovacer and Arandjivlovacer. In Bosnia they are near Bzcker, Bjelniaec, Loorniker, Gradacacer and Tuzla. Valjevo, the principal prune market in Serbia, is often referred to as the "Little Santa Clara" of Serbia. Many grading and packing plants are located there and it is said that at least thirty per cent of all Serbian prunes are handled at that point. Cacak in Serbia is an outstanding quality producing center and much progress has been made there in cooperative drying. Brcko in Bosnia is known as the "Little Hamburg" of Bosnia and fully 75 per cent of all Bosnian prunes go through that market.

The wide distribution of prune plantings over the Kingdom, as shown by the accompanying map, explains the enormous total production when tree yields are normal. From a commercial standpoint, however, only the Serbian and Bosnian areas need be taken into account. There is no commercial industry in districts other than these, the prunes there being used entirely for local consumption. A possible exception is the prune area west of Brcko which in recent years has become an important shipping point for fresh prunes.

### Origin and development of the prune industry

Some botanists of standing claim that the plum was known in Europe in its wild and uncultivated state as long as 2,000 years ago. At any rate there are records showing that the Blue Plum (Blaue Zwetschge) was introduced from Turkestan about 1,000 years ago. At first these plums were grown mostly in the great Hungarian plain but later found their home further south along the Danube and Save rivers in the districts now known as Serbia and Bosnia. The first evidence of plum culture in the latter area is said to date back to the 13th century.

The plum growing industry in Europe developed rapidly and with the domination of Bosnia by Austria-Hungary in 1878 prunes began to be dried for export to other European countries. By 1880 considerable quantities of dried prunes were shipped to Germany. Budapest early became an important prune shipping center. In 1888 a trial shipment of Bosnian prunes was made to the United States through the port of Trieste which soon developed into a flourishing export trade. As a rule only the smaller sizes (Merckantile) were shipped to America and these arrived in casks containing 500 to 700 kilos (1,100 to 1,540 pounds) and in 100 kilo (220 pounds) bags. In 1895 this export trade died down as our home production then became great enough to meet local needs.

During the period 1900-1913 the industry broadened its European export outlets. Exports from the United States at that time were still relatively small. This period saw the prune industry in what is now Yugoslavia at its zenith with an export surplus in 1904 of 118,000 short tons. The annual average export for the period 1904-1913 was about 48,500 short tons.

### Prune industry shows decline

While post-war exports up to 1927 did not vary materially, except in the low crop year 1924, from the pre-war totals, both the trade and the government in Yugoslavia state that the dried prune industry is definitely on the decline. Since 1927 unfavorable weather conditions and scale infestation have greatly reduced the usual export surplus. This, with the large export surpluses from the United States of relatively low priced prunes, has forced Yugoslavia out of many of her former export markets. The situation in general is looked upon as critical but ways and means are now being devised to restore the industry to its pre-war prosperity.

The following table gives the number of trees, the production of fresh prunes and exports of dried prunes from 1920 to 1929. While tree counts from year to year show too much variation to be entirely reliable there is unquestionably a definitely declining number of prune trees. This is reflected in lowered production although tree losses are not the only factor. Unfavorable climatic conditions contributed materially to decreased production in 1927, 1928 and 1929.

PRUNES: Yugoslav production and exports, 1920 to 1929

Years	Number of trees	Production of fresh prunes	Yield per tree	Exports of dried prunes <sup>a/</sup>	Exports of fresh plums <sup>b/</sup>
		<u>Short tons</u>	<u>Pounds</u>	<u>Short tons</u>	<u>Short tons</u>
1920	56,824,891	727,318	25.5	53,000	199
1921	59,023,768	880,105	29.8	26,000	1,481
1922	60,958,902	933,935	30.6	57,000	113
1923	56,268,383	983,031	34.9	62,000	5,130
1924	49,670,000	354,229	14.2	5,000	1,507
1925	52,567,655	1,045,252	39.7	48,000	3,424
1926	50,933,000	1,082,375	42.5	52,000	6,234
1927	48,801,107	613,444	24.9	34,000	8,364
1928	47,316,700	506,290	21.4	20,500	11,712
1929	---	---	---	<u>c/</u> 12,000	<u>d/</u>

Official source.

a/ Crop years September to August.

b/ Calendar years. (All fresh fruit is shipped before end of December.)

c/ Preliminary estimate.

d/ Not yet available.

Causes for the decline

Among the causes most prominently advanced for the decline of the prune industry in the Kingdom are (1) tree losses resulting from the war; (2) low prices for prunes; (3) expansion of the fresh prune markets; (4) unfavorable climatic conditions; (5) lack of credit; (6) limited planting of new orchards, and (7) the spread of *Lecanium Corni* (Schildlaus) infestation.

Opinions as to direct losses due to the war vary too widely to permit of any satisfactory estimate. It is certain that many orchards in Serbia were cut down and used for fuel during the invasion. It is also impossible to estimate the extent of the damage to the prune trees as a result of neglect while owners were away from their farms during the war. The low prices ruling on prunes since the war, however, have had two important results. First, growers have seen no inducement to maintain plantings and second, an increased quantity of prunes has been used for the manufacture of "slivovica" and prune jam, particularly in areas located at some distance from transportation centers.

The shipment of fresh prunes is no doubt an increasing factor in the declining exports of dried prunes. Owing to the small crop of fresh fruits in France, Germany and other central European countries in 1928, there was a particularly good demand for fresh Yugoslav prunes that season. Prices increased as the season advanced and growers found that they were able to realize better returns on fresh than on dried prunes. In view of the labor involved in drying prunes together with the many regulations with which the dried prune industry is now surrounded, the average peasant in Yugoslavia is beginning to sell at least part of his crop in the fresh state when the fresh prune market is favorable.

The unfavorable climatic conditions during 1927, 1928, and 1929, however, were only temporary factors and may or may not occur again for many years. The statement that lack of credit is a factor in the declining tonnage can apply only to such matters as insect and disease control. Young prune stock is available at very low prices from the State nurseries. The failure to replace trees is true only of certain areas. In some districts particularly around Cacak and Uzice the number of new plantings would indicate an expanding industry. The fact of the matter is that the industry in the past few years has tended to centralize in the more favored districts.

That the prune industry faces a serious problem as a result of scale infestation, however, cannot be denied. The infestation seems to center at Valjevo and vicinity, the heart of the prune industry in Serbia. The Government recognizes the seriousness of the problem and has set aside a sum of approximately \$360,000 to be loaned to farmers for the purchase of spray machinery and material. Legislation is now being urged to make the fight against the "Schildlaus" compulsory, but it is doubtful whether such legislation alone would have any effect because of the general apathy of the peasants to all forms of compulsory legislation.

#### Cultural aspects of the Yugoslav prune industry

Prune production in Yugoslavia serves a two-fold purpose. To the average peasant it means a source of brandy and jam and cash income from the surplus that is dried or shipped fresh. To the nation it means exports and a packing industry. The two viewpoints frequently clash. The peasant, primarily concerned with varieties suitable for brandy or jam is indifferent to suggestions from prune dealers and Government officials that the growers should use grafted nursery stock and varieties that will produce larger fruit so that the nation might compete with other exporting countries on the basis of size. The suggestion of such far reaching changes has made the work of rehabilitating the Yugoslav prune industry exceedingly difficult if not impossible. It is very possible that the quick growing, early producing, hardy and easily grown native tree is more suitable to the present state of mind of the peasant than a commercialized industry requiring a high degree of skill and years of experience.

#### Varieties of prunes grown in Yugoslavia

The following varieties of prunes are known to exist in Yugoslavia a. First and most important is the "Pozegaca". This is the native prune, free stone, very blue and with a small pit. It is excellent for shipment in the fresh state. Its popularity with the peasant is due to its excellent brandy making qualities. It dries out small, often falling in the 90-100 size. The next most important variety is the "Tzardurshan" (Emperor Durshan). This prune is grown extensively in Bosnia although not exclusively, as the "Pozegaca" is also found there. The fruit does not split easily but shrivels up as the sugar concentrates. The tree grows smaller than the "Pozegaca", a fact immediately observed in crossing the river Drina from Serbia into

a/ Mr. Paola Petkovich, Director of Agricultural Inspection.

Bosnia. It is propagated from roots but for best results should be grafted onto the "Green Gage". It is sweeter than the "Pozegaca" but not so good for shipping in the fresh state.

The third most important variety is the "Chokeshinka". This has a smaller pit than the other varieties with the fruit longer and pointed. It is used for home drying but is of no great importance. It is found mostly in the vicinity of Shabatch. The next variety in importance is the "Balkan Express" (Fellenberg). This prune has a large pit and is difficult to dry. In size it is the largest prune grown. It is used some for stoning and filling with walnut meat. It is considered a light bearer. The variety fifth in importance is the "Saraja", a small yellow fruit grown in Oblast Pirot near the Bulgarian border. It is too acid for the trade but is otherwise an excellent plum. Other varieties are the "Megarucha", a yellow plum used for slivovica or eaten fresh, and the "Rauka", an early variety eaten fresh and used for slivovica but not used for drying.

It is difficult to compare these varieties with those produced in the United States as grafting, planting, pruning and cultural practices are so entirely different. Of the varieties listed, the one best known on the Pacific Coast is the "Fellenberg", which grafted onto the peach root, is the "Oregon" or Pacific Northwest prune. The fact that it has not given satisfaction in Yugoslavia is not due entirely to the variety, but its natural tendency to bear irregularly is aggravated by the lack of care and conditions under which prunes are grown in that country.

#### Propagation of trees

Young trees in Yugoslavia are obtained either from the nurseries supported by the Oblasts, or from shoots that grow up from the roots in old orchards. Leaders in the industry hope that the use of nursery stock will eventually bring about the entire replacement of native seedlings by grafted trees. Grafted trees are delivered to the farms for three dinars or about six cents a tree. The peasants, however, have not had very much success with nursery stock and express very positive objections to its use, because of the result obtained in grafting the Fellenberg onto the Green Gage and native stock. Other objections to the grafted tree are that it takes ten years after planting to come into bearing while the native tree starts bearing in three years. Although the fruit of the grafted tree is larger, the growers claim that it is less sweet and therefore less suitable for brandy purposes than the native variety. They further claim that native stock has a greater resistance to disease. The fact that the grafted tree will last 75 years or longer while native trees must be replaced in 30 years is of no apparent concern.

The second source of nursery stock is from old orchards, an out of the way corner of which is often left for the purpose of growing shoots which starting from the roots will come up in great profusion. In need of trees, the grower simply picks out the strongest and tallest either for direct planting or for transplanting in the garden for additional growth and training. Occasionally he may go to the nursery for Green Gage stock for grafting but as a rule this is omitted. The fact that the prune output is still largely of the native variety indicates that the nurseries and the grafted varieties as yet play a very minor part.

These characteristics of the Yugoslav prune industry must be understood in order to arrive at any conclusions regarding the future of the prune industry in that country. Under highly centralized and commercialized conditions of production as on the Pacific Coast, the planting or taking out of a prune orchard is a matter of great concern. Initial investment there has been large and there is or has been a wait of some years before production reached maximum. With the peasant in Yugoslavia, however, the orchard is only a matter of minor concern. The prune packers and government officials are far more concerned about the future of the industry than the growers. The growers are but little concerned about the scale (Schildlaus), for if the trees die, they will plant more. New stock is always easy to secure and the orchard comes into bearing quickly. This elasticity of the Yugoslavian prune industry makes any predictions as to its future extremely hazardous.

As to grafting and varieties to use the authorities themselves are not in full agreement. There is a tendency, however, to recommend for the lighter rolling soils the native "Pozegaca" grafted onto the "Green Gage". The value of "Green Gage" was demonstrated in 1928 when these roots held the fruit well while the native trees lost heavily as a result of the drought. Thus grafted the "Pozegaca" has a greater sugar content and the fruit grows larger. This is not recommended for the richer, moist soils as it is a vigorous grower and is apt to flower early, thus subjecting itself to cold spring rains. For these areas the planting of seed from Pozegaca and the use of vigorous Pozegaca scions for grafting is recommended. The State nursery at Kraljevo does not favor peach roots for grafting, as the tree is too weak. The increasing outlet for the fresh prune may have a tendency to increase varieties that promise larger sizes.

The objection to the grafted tree is not confined to the peasants alone. Many of the district inspectors and agricultural agents believe that the natural tree is better for the present needs of the peasant. They further believe that if the natural prune were properly pruned, cultivated and sprayed it would produce a larger and better quality fruit.

### Plantings and cultivation

As the production of prunes is more an essential part of general farming than a specialized industry, large commercial prune orchards are rare. A vast majority of the plantings are part of the homestead and range from one to six acres in extent. As the rural population lives in villages, it is common to find what appear to be relatively large areas of orchard. The relatively small individual plantings make progress in drying methods extremely difficult. The volume produced on any one farm is not sufficiently large to justify modern drying equipment so that antiquated, obsolete and entirely inadequate home-made driers continue in use. The trees are planted in rather carefully laid out rows, from twelve to fifteen feet apart, the owners of the land working on the theory that the more trees on a given area the greater the yield. The effect of such close planting is a tall, spindling type of tree difficult to spray.

As prune plantings are generally a part of the homestead, they become the favorite places for the cow, a few pigs, some chickens and a few sheep which form the livestock for the average farm. Clean cultivation as known on the Pacific Coast is never practiced although now and then the ground is spaded up for a distance of about two feet around the trees. Generally the orchard is in grass, the height of the lower branches allowing the use of the land for pastures. Fertilization is unknown. Trees are headed high, not less than seven feet.

### Plant diseases and pests

According to the Plant Section of the Central Institute of Hygiene in Belgrade, the main prune crop pests in Yugoslavia are the "Scolytidae", the "Monilia", the "Coecidae" and the "Lecanium". The "Scolytidae" (bark borers), are insects which bore large holes in the bark of the trees and cut their way between the bark and the tree. These insects reduce the stamina of the trees so that they are not able to resist other pests, particularly "fungi". They cause the trees to lose their sap and dry out. The "Monilia" is one of the typical blights found in Yugoslavia prune orchards. It causes the well known "Brown Rot" which first attacks and dries up the smaller branches and then proceeds to the larger ones. Plum trees and peach trees both suffer from this pest. The "Coecidae" is a blight which completes the work of drying started by "Scolytidae". The "Lecanium" is a destructive insect which gathers in clusters on the trees.

Parasites of secondary importance are the "Aphididae" or plant lice and the "Psylidae" or jumping plant lice. These cover the branches of the trees with a sweet sticky fluid which becomes an excellent medium for fungus growths. The fungi which spread over this prepared surface create the impression that the branches of the trees are blackened.

Another threatening insect is the "Porthetria Dispar L.," a tree moth which is invading larger and larger areas and has made its appearance at Indjija, a town in Srem, within 25 miles of Belgrade. The center of this infection is at Timok, on the Bulgarian frontier. The larvae of this insect eat the leaves of the trees and these ravages start early in the spring.

No entomological survey has ever been made in Yugoslavia and until this is done and well-defined methods of instructing the peasants and the farmers in the use of preventive measures, the protection of the orchards must be left almost entirely to "natural control" resulting from the counter warfare of hostile parasites. Although the spraying of the vineyards is a well established practice, prune trees are given this protection only in very rare instances. The spraying when done is only effected with one preparation whereas almost each type of pest requires different treatment at different times.

#### Spraying

It is only since the appearance and spread of the scale (Schildlaus) that any attention has been given to the matter of spraying. Occasionally tree trunks are white-washed but that appears to be done more to enhance the appearance of the homestead than to control any particular insect or disease. Except on the poorer soils and the scale infected orchards, the trees appeared thrifty in spite of lack of spraying. Up to the appearance of the scale, the resistance of the native wildling variety to disease was one of the strong arguments in its favor. At the prune conference held in Belgrade in December 1928, it was freely admitted that the attack and spread of the Schildlaus is alarming and difficult to cope with in the older orchards. The leaders in the industry accordingly recommended legislation to compel all growers to spray and thoroughly clean their orchards at one time.

#### Quality of Yugoslav prunes

The quality of the Yugoslav prune from the standpoint of acidity has been frequently stated as falling somewhere between the California and Oregon prunes. It is not as sweet as the California prune nor as tart as the Oregon variety. Unfortunately no adequate comparisons as to chemical contents of the fruit are possible. The Agricultural Experiment Station at Vienna on December 4, 1912 published the following analysis of the Yugoslav prune: Non-nitrogenous matter 59.33 per cent; sugar 54.35 per cent; nitrogenous matter 2.39 per cent in addition to ashes, ethereal extracts and raw filaments. It is somewhat difficult to make a comparison as to relative quality, as drying and preparing for the market in Yugoslavia differ entirely from practices on the Pacific Coast. The Yugoslav fruit of seedling tendencies has a flavor peculiarly its own, appreciated in certain markets.

The pit of the Yugoslav prune is small and freestone, a characteristic taken advantage of in offering pitted prunes which are popular in certain markets. The skin is tender and for that reason the fruit is said to be unsuitable for the "dipping" or water method of processing. The fruit runs small in size and as it is not washed prior to boxing it has not the appetizing appearance of prunes from other countries. An investigation of the driers showed that the oven walls are subject to cracking. This, when it happens, permits smoke to enter the fruit chamber, resulting in a smoky flavored fruit. This undoubtedly would be more likely to happen in the later dryings than of the first.

While Government rules for inspection went into effect in 1922 the quality of the Yugoslav prunes in export markets has not been up to normal during the past two years. The exporters in Yugoslavia blame the scale and climatic conditions. One must keep in mind, however, that the export markets since the war have been flooded with excellent quality, reasonably priced prunes from the Pacific Coast. This brings up the question as to whether the lowered quality of the Yugoslavian prune may not be more a relative than an actual depreciation. Prices on Yugoslav prunes in the crop years 1927 and 1928 have been relatively high. In fact they have often been higher than American prunes. On such occasions the matter of comparative quality immediately came to the foreground. While prices on Yugoslav prunes were relatively low the matter of quality was only a minor consideration. The fact of the matter is that Yugoslavia under the existing obsolete methods of production, drying, and packing, cannot compete with her competitors on an equal price basis. The leaders in the Kingdom realize this fundamental truth and strenuous efforts are being made to improve conditions. Legislation to assure a quality product have been enacted and leaders in the trade hope that they will have the desired results.

#### Organization for the promotion of better cultural methods.

Politically the Kingdom is divided into 33 departments of "oblasts". There are two agricultural agents in each of these "oblasts", one appointed by the Kingdom and one by the Government of the department. Each of the "oblasts" is subdivided into "Szec" or counties and in each of these there is another agricultural agent working under the supervision of the "oblast" agent. The work of the county agents is closely tied up with that of the "oblast" nurseries of which there are 165 in the Kingdom. Up until two years ago these nurseries were supported by the Kingdom but they are now supported by the "oblasts" and are under the control of the "oblast" agricultural agent. This agricultural organization is of importance since immediate and future development in the prune industry in Yugoslavia will depend to a considerable extent on its activities. Unfortunately there is at the present time but little cooperation between the agricultural agents appointed by the Kingdom and those appointed by the "oblasts". Better results could be expected if the work were coordinated under one head. The horticultural program now being planned for the Kingdom, while primarily centering on prunes, includes the development of a fresh fruit industry with particular attention to the export market.

Government crop forecasts are made in connection with the above organization. The first crop forecasts are made in May or June after the critical blossom period has past and the fruit is known to have set. Additional forecasts are made during the summer as serious damage may be suffered by the prune crop during that period from rain, heat, hail, hot winds, and from scale. The merchants therefore hold meetings during April, July and August in order to keep themselves informed of the situation. On September first the prune division of the National Merchants Association at Belgrade holds its principal annual meeting and merchants coming in from all parts of the Kingdom give their reports as to prune estimates. These reports are compared with the Government reports submitted by the County Agricultural Agents and the results are published. The Agricultural Agents are seriously handicapped in securing their estimates as neither automobiles nor telephones are available.

#### Harvesting and Drying Prunes in Yugoslavia

Prune trees blossom as a rule from about the 10th to the 20th of April and the fruit begins to ripen the latter part of August. Harvesting lasts until about the end of September. In the higher elevations harvesting begins and ends somewhat later. Some of the early fruit destined for the fresh fruit markets is picked from the trees. For drying purpose the trees are shaken at intervals in order to secure the fruit in best possible condition of ripeness. Poles are used for knocking the fruit from the trees. Straw is usually spread on the ground first. The fruit is picked up from the ground, placed in baskets and carried to the driers.

The proper time to harvest is a great factor in securing quality fruit. In sections such as Yugoslavia and Oregon where fall rains come early there may be a tendency to hasten harvesting to the point where quality is injured. Prunes that are too green or too ripe damage the quality of the resultant pack. Yugoslavia attempts to meet this problem by not allowing the peasant to offer new crop prunes before a certain date. For a time this date was September first but has later been changed to September fourteenth. This date is subject to change depending upon each year's harvest season. Agricultural inspectors advise growers of the correct time to start harvesting. There is a feeling among both peasants and prune merchants that this rule is frequently evaded. Leaders in the trade have suggested that prune specialists be appointed who would travel to the principal prune areas and for a month prior to harvesting advise the growers as to proper methods of drying and harvesting.

#### Production costs

As the growers look upon the prune crop as one requiring no cash outlay, no satisfactory estimate can be made on the cost of production. The orchards receive practically no pruning, cultivation, spraying or fertilization. Land values can hardly be estimated since the land remains in the family from generation to generation and is hardly ever offered on

the market. The Ministry of Agriculture, however, has stated that good grain land in Yugoslavia is worth from \$175 to \$250 per acre and the hilly lands suitable for prunes from \$90 to \$175 per acre. Trees for prune orchards can be secured from the nursery at less than 6 cents each or at no cost at all from the old orchards. Drying in most cases requires no cash outlay and fuel is plentiful. The cost of harvesting is likewise indeterminable. The Yugoslav peasants are fond of working in groups and as the prune harvest does not come until most of the other farm work is completed, it becomes a sort of festive occasion. Labor is freely exchanged and as even the baskets in which the fruit is collected are home-made, there is really no cash outlay.

#### Drying methods

Drying methods used in Yugoslavia are still very primitive and although Government authorities are giving a great deal of thought to the matter, changes for the better are accepted very slowly. This is largely because the individual plantings are too small to allow of anything other than the inexpensive home-made structures. It is only where groups of growers have combined as in Cacak, Serbia, that the more expensive improved types have been adopted. From all indications, improved drying methods are being accepted more readily in Serbia than in Bosnia.

The types of driers most commonly used are known as the Bosanska, the Glavinich and the Stoykovich. Of these, the Bosanska is the most primitive and still the most commonly used. This system has been developed by the peasants. The drier is made out of clay or loam and the peasants consider it no burden to entirely rebuild or repair the plant every fall. Everything needed for its construction is found on the farm and represents no cash outlay. In its simplest form it is a small rectangular structure built out of loam in each end of which stands a big loam stove resembling a baker's oven. Immediately above this stove is a cabinet arrangement constructed so as to allow home-made trays to slide in or be pulled out. In reality it is only a step removed from the drying of fruit over an open fire as still practiced in Roumania. No holes are provided for ventilation. The Government, realizing that the adoption of more modern systems of drying is extremely slow, is urging peasants to at least provide some degree of ventilation in this type. An improvement on the Bosanska drier was found in a few places where the oven was constructed of brick and where some means were provided for conducting the combustion gases through the drying chamber to the outer air.

The trays in the Bosanska drier are loaded with one layer of fresh prunes and placed in the drying chamber allowing some space between each tray. When filled, the cabinet or drying chamber is closed and the fire started. After ten hours of 50 degrees centigrade heat, the trays are taken out and the fruit allowed to cool. After that they are given another ten hours of about 70 degrees centigrade heat. They are again removed to cool and then given a third ten hours of from 80 to 100 degrees centigrade after which they are sorted and the fruit not yet cured is subjected to a fourth treatment.

The Glavinich drier is essentially like the Bosanska in operation and construction except that metal piping for conveying combustion gases traverses the inner chamber several times before discharging into the outer air. Near the top of the drying chamber small openings allow the escape of moisture laden air. This system is thought to have increased circulation sufficiently to secure about fifty per cent "hot air" and fifty per cent "direct heat".

The Stoykovich drier is more scientifically designed. All heating is by "hot air" and ingress for cold air and outlet for used air insures ventilation. The longer inclined tunnel creates a natural draft. Danger of fruit burning has been reduced by placing the fire box some distance away. The metal oven is placed in a 10 x 8 x 3 foot basement and metal pipes run through an 8x8x6 foot heater above the oven. The drying chamber or tunnel holds five racks and the racks hold ten trays. This drier is so constructed that it can be used either continuously or separately. In the latter case, the fruit would have to be taken out at intervals as in the more primitive types. Where used as a continuous type the fresh fruit is admitted at the upper end of the inclined tunnel under a steadily maintained temperature of 50 degrees centigrade. After ten hours a new lot of trays is introduced forcing the first lot toward the main heating chamber where the temperature is kept at 65 degrees centigrade. After the second ten hours a third lot of trays pushes the first lot just over the oven where they are held for ten hours at about 80 degrees centigrade. The introduction then of the fourth lot of trays forces out the original lot so the process is continuous. The agricultural schools in Serbia have built Stoykovich driers as models for demonstration to the peasants.

At the Belgrade prune conference in December 1928, it was urged that the Government should provide credit with which to encourage the construction of modern cooperative driers and that a great deal of attention should be given to demonstration courses in the building of modern driers. Such courses were held for the peasants at Cacak soon after the war with excellent results. While many of the existing regulatory measures have been useless the above suggestions if followed out would remove many of the present objections to the quality of Yugoslav prunes. It is manifestly useless to have prunes harvested at the proper time only to be subjected to the primitive methods of drying described.

The following table gives results from experiments made with the three types of driers above described:

Operations	Unit	Bosanska	Gleavinich	Stoykovich
Fresh prunes used .....	Kilos	1288	1285	2928
Dry prunes obtained .....	"	373	368	835
Rate of dry-down .....	Ratio	3.45	3.49	3.5
Weight of firewood used ..	Kilos	1634	1105	1219
Weight of firewood consumed per 100 kilos of fresh prunes .....	"	127.17	85.99	41.17
Weight of firewood per 100 kilos of dried prunes ..	"	438.87	300.27	145.98
Duration of drying .....	Hours	30.3	29.30	55.30
Duration of drying per 100 kilos of fresh prunes ..	"	9.19	9.11	6.17
Percentage of dry prunes obtained .....	Per cent	28.88	28.63	28.54
Average charge at one time ..	Kilos	322	321	882

Mr. Kenneth Patton, American Consul at Belgrade.

Note: One kilo = 2.2046 pounds.

#### Cooperative drying in Yugoslavia

Cooperation among farmers in the Kingdom is limited very largely to financial and credit associations. Their object is to furnish long time loans at low rates of interest and to buy seeds, implements and fertilizer at cost for the farmers. The need of cooperation among prune growers is nowhere greater than in drying. Prune plantings are too small to allow of investments for expensive drier equipment but such equipment could be financed cooperatively. One cooperative drying enterprise has been in successful operation in the progressive prune district near Cacak. Twelve of the Stoykovich or improved type driers have been constructed there at a cost of from 15,000 to 20,000 dinars, \$267 to \$353 each. The Government contributed 120,000 dinars, \$21,000 towards this construction. Growers donated labor during construction and shares were sold at 100 dinars, about \$2.00 per hectare (2.471 acres). A president, vice-president and six or seven directors constitute the governing board. In addition to the driers a central building supplies storage, grading and office space. The latest government efforts to aid the prune industry include courses in the construction of driers as well as financial assistance in the building of cooperative driers of the more improved type.

There is no contract between members and the cooperative enterprise. Before harvest a price is set on the fruit and from one-half to three-fourths of this price is advanced as the fruit is delivered for drying. This price must be fairly high in order to hold the membership yet not too high in order to show a profit later. The money for the advance is borrowed from the Central Cooperative Credit Association, of which this cooperative is a member. Rate of interest is 10 per cent. After drying and grading the prunes are sold. The cost of drying, the cost of operating, insurance and a 20 per cent reserve, are deducted from the returns and the balance is distributed among the members according to the amount of prunes each delivered. The plan has worked fairly well notwithstanding short crops in recent years. According to prune buyers, the quality of the prunes has been much improved.

#### Local Handling and Marketing of Prunes

Weekly or periodical market days are characteristic of most European countries and is a social and economic feature of life in Yugoslavia. The roads in the neighborhood of the towns on market days are almost impassable with endless processions of peasants carrying turkeys, small roasting pigs, chickens; herding a few sheep or goats or driving an ox team load of cord wood. National peasant costumes representing the Serb, the Musselman or the Croat form a colorful picture. In the larger Yugoslav markets the produce is segregated but often the main street is turned into a hodge-podge of miscellaneous farm products. The market starts early in the morning and is generally well over by noon. The municipal scale is an ever-present and useful article. It is common to charge a small tax for using the market.

#### Marketing the crop

Unless a peasant has sold his prune crop green, an increasing practice with the expansion of the fresh prune outlets, he hauls his dried prunes to these markets where he and the "prune merchant" try to arrive at a satisfactory price level. Before entering the market, the prunes are taken to the official scale and weighed and in exchange for the proper fee the peasant receives a weight certificate. In case of sale, payment is made in accordance with this certificate. After weighing, the prunes are allowed to go on the market, but before being offered for sale, they must be examined for quality by the Market Commission. If satisfactory they are passed but in case of rejection the goods are taken to storerooms for sorting and redrying in the municipal driers established for that purpose. Besides having to pay all expenses involved, together with the customary fee for redrying, the owner is fined in addition.

The inherent weakness of this method of inspection lies in the fact that the general level of quality is too low, due to inadequate drying methods. A competent and honest decision on the part of the Market Commission can only be made on the basis of comparison of the general level of quality offered which may or may not be high and generally is not.

### The prune merchant

Grading and packing of prunes is not attended to in one plant in Yugoslavia as on the Pacific Coast. As a result an extra factor, known as the "prune merchant", enters into the trade. He buys the fruit from the growers and grades to sizes before selling to the packing and exporting firms. He forms the direct contact between the peasants and the packer-exporters. His services consist in buying and grading the fruit, requiring therefore some sort of warehouse and grader equipment. Generally, he is engaged in other lines of endeavor making prunes a side-issue. The peasants are frequently indebted to him for feed or groceries or other essential articles. Some of these merchants sell directly to the trade in bags but most of them act as buying agents for the big exporters located in Brcko, Valjevo and Belgrade. Commission for buying and grading in that case is uniformly five per cent. Owing to severe losses taken by the trade in prunes the last two years, very little speculation is now noted.

Prunes continue to arrive on the markets until the end of the year but the heavier sales are made immediately after drying. The peasants are kept informed of prices through the Agricultural Agents but generally these prices are arrived at on the basis of quality, available supplies and the demand for that particular day. After having paid weighing fees and passed inspection the farmer seldom takes his prunes back home. The cash income from the prunes is very welcome and is often the occasion for weddings and general festivities.

### Price factors

Peasants may be approached as early as July to sell their fruit, either on the basis of delivery as dried prunes or the crop may be purchased fresh in which case the merchant decides whether to dry, to ship fresh, to make jam or turn the fruit into rakia. Whether the peasant sells or holds his fruit the prices ruling on the various by-products of the fresh prune will determine what is done with the prunes finally. This price factor, very pronounced throughout all the prune sections, makes it difficult to forecast the percentage of the crop that will go into the various by-products each season.

While the peasants generally are not commercially inclined they display much shrewdness in their own way of bargaining. In the matter of ruling prices, they are constantly assisted by the Agricultural Agents who are, however, handicapped by the absence of telephones and automobiles. It is estimated that 220 pounds of fresh prunes will turn out about 6.6 gallons of 20 per cent slivovica, 60 pounds of dried prunes and from 44 to 55 pounds of jam. These facts, combined with ruling or prospective prices, enable the peasant to make surprisingly good bargains. The possibility of turning to products other than dried, is an inherent advantage of the Yugoslav industry. Prunes that are too ripe or split

or are otherwise unsuited for drying purposes cannot only be used for jam or brandy but may actually be more suited for those purposes. Low prices on dried prunes act as an automatic check on the quantities dried. This was well illustrated in the crop year 1928 when many districts located away from centers of transportation turned to jam or brandy rather than to the dried prunes.

#### Handling of prunes closely supervised by the Government

Government rules and regulations for the marketing of prunes are numerous. The Government regulations being to operate at the time of harvest when the date for offering new crop prunes is established by the Government in order to assure that the prunes will not be harvested and dried before the proper stage of ripeness. From this point on, all rules and regulations as to the quality, storage, weight and inspection for export are administered by what are known as "Market Commissions". These Commissions are appointed and supported by the Government and are located in prune markets agreed upon by the Prune Export Association, the Government and the Chambers of Commerce of Belgrade and Sarajevo.

Every firm desiring to deal in prunes must notify the police before September first of the location of the warehouse. The police authorities deliver the list to the Market Commission. All such warehouses are under the continued control of the Commission. No prunes or jam may be stored in warehouses without examination. If shipped for domestic consumption, dried prunes and jams need not be inspected. The owner of the warehouse must keep a careful record of all incoming and outgoing prunes and jam and such records must at all times be available to the Commission. Incoming prunes must be shown to the Commission not later than 24 hours after delivery. Outgoing prunes are examined by the Commission upon not less than six hour notification. Goods destined for export must be examined where loaded and a certificate must be issued. No prunes are allowed to leave the country without this certificate. In case of dispute the Minister of Industry and Commerce acts as arbitrator.

The municipal markets are also under the control of the Market Comissions. Municipal courts may appoint a representative to the Market Comissions; to act with them and render assistance. Prunes are to be weighed only on the municipal scales. Sacks must be dry and sound. Old or dirty bags or cases are not allowed. Bulk prune loading is prohibited. When shipped in the open, oil-cloth must protect the fruit from the rain. Mayors and police officers in the various municipalities support the various agencies and commissions. Fines are assessed by the County Prefects (Veliki Zupans) and go toward a fund used for the development of the industry.

While these regulations would seem to insure that only perfect fruit could be exported, the quality of the exports in recent years, hardly bears this out. Comments at the Belgrade prune conference on December 12, 1928, frequently referred to the harm done by unscrupulous factors in the trade. Well intentioned as these regulations appear, there are evidently possibilities for evasion. Present changes, urged by the Export Association, involve fewer markets and fewer Market Commissions to secure better control. Special Commissions under the authority of the Market Commissions, giving their entire attention to certifying prunes for export are now advocated.

#### Grading and Packing Operations

The practice of grading prunes into sizes is a relatively recent development compared with the age of the industry itself. The first automatic machine for the grading of prunes was invented by a firm in Budapest in 1882. Instead of the power driven, mammoth graders of long length now in use on the Pacific Coast, the graders in Yugoslavia are still very primitive and have not changed materially from the invention of 1882. It is best described as a rectangle frame about eight feet long, three feet wide and six feet high. Within this frame are suspended sieves, inclined in opposite directions, the prunes falling through from the sieves with the larger openings to the next smaller and so on until the very small or "Mercantile" prunes come out at the bottom. The number of sieves depends on the number of sizes desired.

After the prunes have been weighed, inspected and bought by the "prune merchant", they are taken to the warehouses for grading. Workmen carry the prunes in baskets to the grader. The plant is singularly free of machinery as the grading machine is operated by hand. The sizes graded out are 70/75, 80/85, 95/100, 110/120 and 120/130 and "Mercantile" or the very small sizes. The count is based on a 1/2 kilo (1.1 pound), which transferred to the American pound would make the corresponding sizes one class larger. While gradings formerly might fall anywhere between zero and the five point, the tendency now is to grade closer to the five point. This is somewhat difficult as graders are not supplied with "blending" boards as on the Pacific Coast.

#### Packing prunes

Packing methods in Yugoslavia are closely patterned after the French system which sterilizes the fruit but does not wash it. The term "Etuvage" by which prune packing plants are known in Yugoslavia, is derived from the word "Etuve" meaning "sterilization". In its simplest form, considering the drying on the farm as one sterilization, it is a second drying or sterilization or baking process and the term "double etuviert" (twice sterilized) originates from this fact.

The packers in Yugoslavia as well as in France, claim certain distinct advantages for this method. In the first place it does not injure the skin, an important factor in Yugoslavia where the skin of the prune is very tender. Second, it preserves the natural aroma of the fruit, a point stressed frequently and third, the syrup collected on the outside of the dried prune is not washed off but is baked in, resulting in a black finish, a fact appreciated by the trade. There is a well pronounced sentiment in Yugoslavia, that the long water shipment of bag prunes, piled high in the barges, destined for northwestern Europe, there to be "dipped", has been a contributing factor in the unsatisfactory quality of the Yugoslav prune.

While there are many warehouses for storing and grading prunes, the Kingdom altogether has only about 36 packing plants or "Etuvages." Belgrade, the capitol, while still one of the most important prune market centers, is no longer important in prune packing. Valjevo, in Serbia and Brcko in Bosnia have become the leading centers of packing and general prune activity. Other important prune packing centers are Shabats, Cacak, Kragujevats, Uzitze, Pozega and Loznitza in Serbia and Doboj, Tuzla, Rosanski, Shamats and Grachanitsa in Bosnia. The Kingdom's packing facilities in recent years have not been used to full capacity, due partly to the smaller crops since 1927 and partly to the sale and shipment of bag prunes to such packing centers as Hamburg, Vienna, Budapest, Bratislavia, Passau and Regensburg. Some of these plants are owned by exporters located in the packing centers who deal directly with the foreign importer. Most of them however, are owned by financially responsible firms or export banks located in Belgrade, Vienna or Budapest. Many of these banks have an export branch the stock of which is controlled by the parent bank. In this respect, the banks take a more direct part in the movement of the prune crop than is the case in America.

Very often a "still" for the making of brandy is operated in connection with the packing plant. Occasionally an "etuvage" will have its own grader plant nearby but as a rule prunes for packing are bought already graded as to size. The packing plants are usually three story, relatively narrow, masonry structures. Except in plants where prunes are first pressed into steel cylinders, they are extremely simply in both construction and equipment. Some of the less modern plants are entirely lacking in machinery, even the pressing of the prunes into the boxes being done by men tramping the fruit down after first covering the prunes with sacking. The top or third floor may be given over to storage of shook and the making of the boxes. Facing is done on the first or second floors and baking on the first floor.

Facing the prunes, or carefully arranging the top layer, is accomplished by taking each individual prune and placing it in the bottom of the box which later becomes the top of the finished pack. Prior to the war, this practice was universally followed on the Pacific Coast but has been discontinued due to additional cost and danger of spoilage. The practice is still followed in Yugoslavia, however, where labor cost is not so large an item, women exclusively doing this work. In one plant the rate paid for facing was 50 paras or 1 cent per box. Prior to the facing, the boxes are lined

with paper and fancy mats. The box upon completion resembles the Pacific Coast fancy Christmas packages.

In the less pretentious plant, the faced boxes are carried to the lower floor where they are placed end to end in a double row and filled with prunes. In case the prunes are too wet to go directly into the boxes, they may first be spread out on open trays and there be subjected to heat in the bake ovens. The prunes are then tramped down into the boxes or placed under the press as is now generally practiced in the better plants. After this, they are weighed, the tops are nailed on by hand and they are ready for the sterilizers.

The prunes, thus packed, are placed on a car whose steel frame is so constructed that ventilation between the boxes is possible. These cars operate on tracks which frequently run almost the entire length of the plant and enter the oven or drying chamber. The chambers or dry kilns are lined up in batteries of two or four depending upon the size of the plant. The walls and top are of masonry and doors and framings of steel. The hot air in the chamber is supplied by the metal smoke flues running beneath the tracks from fire boxes located beneath the ovens at one end of the chamber. Steady temperatures are maintained by means of thermometers and ventilators. The prunes are left in the kilns from twelve to eighteen hours at a temperature of from 100 to 110 degrees Centigrade, depending upon the condition of the fruit. It is stated that the interior of the packed boxes reaches a temperature of 70 degrees Centigrade. Owing to the heat the boxes themselves often spring open and require renailing. The shrinkage is very slight unless the prunes were too wet when they are sent in.

The method above described is a modification of the true French system under which the prunes are first placed in steel cylinders, 5 inches across and 3 feet high and holding from 26 to 33 pounds of prunes. From 55 to 60 of these cylinders are placed in a circular tank, the bottom of which is perforated for the admittance of steam. The tanks are closed and brought to a temperature of 100 to 105 degrees Centigrade by the application of steam. The cylinders are taken out after four hours. The fruit is then emptied into faced boxes and pressed down. The packed boxes are then weighed, nailed and sent to the baking chambers for another period of four hours. This more complicated system of packing is rarely used in Yugoslavia.

The larger and more modern packing plants employ from forty to fifty workers during the prune season. The packing industry appears to have made greater progress in Bosnia than in Serbia, due undoubtedly to the influence of Austro-Hungarian control prior to the war. Packing plants in that district are larger and the work seems to be better organized. While, on the Pacific Coast, brands and markings are largely printed by machines made for that purpose, in Yugoslavia the lithographed label is exclusively used. Size and destination marks are brushed on by hand. For strapping material a broad flat band is used instead of the wire used on the Pacific Coast. It is put on the boxes either by hand or with a small machine.

The Yugoslav prune box is longer and narrower than the standard box used in America. The most commonly used boxes are the 12½ kilo (27.5 pounds) and the 25 kilo (55 pounds) sizes. The box used for exportation to Czechoslovakia, however, holds 33 kilos (72.6 pounds) as that country has a higher export duty on packages holding less than 30 kilos (66 pounds). The length of the boxes, inside measurement, is 55 centimeters (21.6 inches) and the width 21 centimeters (8½ inches). The depth varies with different weights. The smaller 5 or 10 kilo (11 or 22 pound) boxes are packed in considerable quantities for the Christmas trade. Cartons are practically unknown although small lots go out in paper bags, holding 2 kilos (4.4 pounds) and packed 24 to the case. The paper bag is made of a heavy grade paper and is closed by folding twice and the ends turned over.

An outstanding characteristic of packing prunes in Yugoslavia is the lack of machinery and the universal use of man power. Packing is done almost entirely on a piece-work basis. A charge of 6,000 dinars per car-load of 10,000 kilograms (22,046 pounds) packed in 12½ kilo (27.5 pounds) boxes appears to be customary. This is at the rate of slightly over a half a cent per pound. This does not include receiving and grading costs, which as pointed out, is done elsewhere. There is no packing or processing gain. On the contrary there is a possibility of a slight shrinkage.

Grading establishments and packing plants also come under the supervision of the Market Commissions. Every packing plant has a mark which must be registered with the Ministry of Industry and Commerce. Packing plants must exercise cleanliness and care in packing. Old and new prunes must be kept separate and it is forbidden to mix old and new crops in packing. Fines are levied in case of violations of these rules. Any prune merchant who adds water to the fruit, mixes old with new, adds something to the prunes, buys slack dried, unripe, burned, smoky, sour, rotten fruit or prunes without brilliancy is punished by a fine.

#### Selling prunes for export

#### Export procedure in marketing Yugoslav prunes

Belgrade is by far the outstanding center for the marketing of Yugoslav prunes. Until recently it was also a packing center but it was found more economical to pack in the producing areas. The financial institutions and exporters responsible for the sale of a large percentage of the crop are located in Belgrade. Valjevo is the center for packing in Serbia and for some direct selling for export. Breko and Tuzla in Bosnia are important centers for direct selling. Breko is located on the northern boundary of Bosnia on the Save river and has rail connections to every part of Europe. A few large operators in Vienna and Budapest have packing plants in Yugoslavia or are closely allied with local packing concerns. Sales are made by the exporters to brokers located in the importing markets. Commissions on sales are generally two per cent. Sales to Vienna and Budapest are made direct to the importers.

Prunes sold to Vienna, Budapest or Passau are often sold f.o.b. shipping point in dinars. Prunes sold in Holland, Belgium or Germany are often sold in guldens, francs or marks although frequently the deals in Hamburg are made in dollars. Drafts are payable upon arrival accompanied by necessary documents but as quality, count and weight is determined after arrival it cannot be said that the transaction is closed until goods are accepted or until the arbitration board has made its decision. As a practice, prunes from Yugoslavia are not consigned, trade factors fearing storage charges at delivery points. Sales to such distant points as Hamburg or the Scandinavian countries are c.i.f. but to such nearby points as Vienna and Budapest they are often f.o.b.

#### Export classification

In making sales for export, the term "garniture" is generally used when prunes are offered in large quantities. The usual "garniture" consists of 1 car of 80/85's, 1 car of 90/95's and 1 car of 110/120's. This is sometimes called the "male" or small garniture. As one car contains 10 metric tons the lot in the aggregate consists of 30 metric tons (66,150 lbs.). It is wrong to assume that all sales come under this term, as assortments, particularly to nearby markets, may entirely ignore this classification.

The "voliki", "gross" or large garniture, consists of 1 car of 70/75's, 1 car of 80/85's, 1 car of 90/95's, and 1 car of 110/120's. This lot contains 40 metric tons (88,200 lbs.). The "ober" or over garniture, used before the war consisted of 1 car of 70/75's, 1 car of 80/85's and 1 car of 90/95's. The "garniture wagon" consists of one car of 10 metric tons (22,050 lbs.) and contains 1/3 - 80/85's, 1/3 - 90/95's and 1/3 - 110/120's. Prunes smaller than 120's are known as Mercantile.

Before the war the count might have been anywhere between zero and five, but it is now as near as possible or exactly on the five point. In the trade the five point is ignored so that an 80/85 is known as an 80 and a 90/95 as a 90. Size marks on the boxes correspond to this. Unprocessed prunes are sold in bags containing 50 to 100 kilos, (110 to 220 lbs.), gross for net, bag free. Boxed prunes are offered net. C.i.f. sales are figured, price f.o.b. packing plant plus freight, commissions, discount and insurance.

#### Length of shipping season

The earliest shipments for export are determined by the growers' delivery date as set by the Government each season. Under normal conditions this date falls on September 14. Allowing for assembling, grading and packing, the shipping season starts about September twentieth and continues until the end of the year. Shipments by months show that Yugoslavia ships heavily until the first of the year with relatively small quantities the first quarter of the new year. This is due to the fact that the trade looks upon Yugoslav prunes as a winter article lacking the keeping quality for summer consumption. For this same reason, Yugoslavia has no surplus or carryover problem. The fruit will not stand a second season so that any dried stock that cannot be moved out is turned into brandy. In determining market prospects or supplies on hand, the carryover feature in Yugoslavia can be ignored.

### Marketing procedure

The contract used in selling Yugoslav prunes is comparatively simple. The general terms state that the prunes shall be sound, well dried, good average quality, of stated crop year, gross for net shipped in suitable jute bags, and of either Bosnian or Serbian origin. Prunes in boxes must be "doppel etuviert", and the stated weight of the box must be the net weight. Prune jam must be free of scorched fruit and pits and must be packed in new barrels or kegs. Space is left in the contract for condition of sale, price and responsibility. Shipping terms are left at sellers option up to a specified day. Tolerance is 2 per cent against Yugoslav loading weight. Delivery may be either by rail or water, unless definitely specified. Payment must be made upon presentation of documents attached to draft. A court of arbitration is provided for at the point of delivery to determine penalties in case of faulty goods. The decision of this court must be accepted by the shipper. The contract provides for the inspection of the goods upon arrival for quality, weight and count.

The Hamburg "Warenverein" has set up the following rules: Samples shall be taken out of either ten bags or twenty boxes per car-load. On sizes 60/65, 70/75 and 80/85, if delivered prior to December 31, tolerance for count is 3 points, per  $\frac{1}{2}$  kilogram (1.1 pound). On sizes 90/95 and smaller tolerance is 4 points. For delivery after December 31, tolerance is increased by 2 points per  $\frac{1}{2}$  kilogram. If count exceeds the tolerance the buyer deducts the difference proportionally between delivery points and next grade. All prunes sold on count must have been graded. The penalty is determined by the market price on the day prunes arrived. If count is ten per cent above normal the lots are not deliverable.

Documents generally consist of the Bill of Lading, Insurance Certificate and Inspection Certificate. The inspection certificate, however, is not recognized by the trade. It is issued by the Yugoslav Government before the goods are allowed to leave the country. Inspection therefore is after arrival and not at source. The contract provides no protection for seller in case crop losses are severe and general, unless such conditions are written in. The buying back of contracts or penalties for non-delivery, therefore, are quite common. It is customary to refer cases of non-delivery to the Export Association of the Board of Merchants and Exporters in Belgrade, whose judgement is final. Justice to buyers is influenced by a desire of the Belgrade merchants to retain the good will of the export trade.

Since there is no protection against severe and unavoidable losses to the crop, the selling of futures involves a great deal of risk. The crop year 1928 was particularly unsatisfactory in this respect. Not only was there much complaint as to quality in import markets with consequent penalties, but crop losses in both Oregon and Yugoslavia advanced growers

prices at time of delivery. Prices on futures may be quoted as early as July and often from a third to half of the estimated crop is sold from that time until September. Crop conditions and probable price trends determine the quantities that are sold early. Owing to crop uncertainties and trade losses during the last three years, future sales have declined considerably.

#### Export distribution of Yugoslav dried prunes

The most important export markets for Yugoslav prunes are Germany, Czechoslovakia, Italy, Austria and Hungary. Germany is by far the most important export outlet, having taken during the four years 1925-1928 about 37 per cent of the total as against an annual average of 33 per cent during the five years 1920-1924. There has been a tendency to ignore Yugoslav prunes in northwest Germany in recent years due to the declining tonnage of the Yugoslav export surplus, and to the availability of superior quality American prunes which have proved more suitable for packing than the less carefully dried Yugoslav prune. This tendency has not been so true of southern Germany, however, where special facilities have been established for packing Yugoslav bulk prunes.

Exports to Czechoslovakia have increased greatly in recent years, shipments to that market during the four years 1925-1928 having averaged 20 per cent of the total as against only 3 per cent of the total during the five years 1920-1925. This tendency is of considerable significance to Pacific Coast shippers as the declining tonnage in Yugoslavia and increased purchases by Czechoslovakia may cause a corresponding increases in the demand for American prunes in northwest Germany.

Exports to Austria during the four years 1925-1928 averaged 12 per cent of the total as against 22 per cent during the five years 1920-1924. Austria takes bulk prunes mainly and packs a considerable portion of the imports for the reexport trade chiefly to Poland. The steady decline in the Austrian imports from Yugoslavia in recent years is due to the fact that the Vienna packers have been drawing more and more upon the United States for their supply of bag prunes.

Exports to Italy during the four years 1925-1928 averaged 13 per cent of the total as against 22 per cent during 1920-1924. Practically all of the Yugoslav prunes shipped to Italy consist of boxed stock. Annual exports to Hungary during 1925-1928 remained at about the same level as during the preceding five years. Average shipments to Denmark, Poland, Holland and Belgium show increases during the four years 1925-1928 but those to England, France, Greece, Switzerland and all other countries show a decline. The table on page 34 gives the exports of dried prunes from Yugoslavia in recent years by countries of destination.

### Exports of fresh prunes

With improvements in rail transportation the export of fresh prunes from Yugoslavia is assuming increasing importance. Exports of fresh prunes have increased from an average of only 7,429,000 pounds annually during the five years 1920-1924 to 51,639,000 pounds in 1928. In point of time they reach the consuming markets somewhat ahead of the Bohemian crop, the first carloads moving out about the middle of August. Brcko in Bosnia is an important center for this trade. During the shipping season special cars are attached to the faster trains reaching the more important markets in from two to four days. Formerly these prunes were packed in baskets but in 1928 crates were used extensively for the first time. These crates are made of slats, placed about 2 centimeters apart allowing for ventilation. The capacity of these crates is from 44 to 66 pounds net. The table on page 34 gives the exports of fresh prunes from Yugoslavia by countries of destination over a period of years.

The short crop of fruit in central Europe during 1928 was a material factor in the large exports of fresh prunes from Yugoslavia that year but since shipments had been increasing steadily during the preceding four or five years it may be concluded that a permanent outlet has been developed for Yugoslav fresh prunes. Austria is by far the largest market for these fresh prunes. Italy, Czechoslovakia and Germany have become important only in the last three years. Prices on fresh prunes in European markets advanced sharply during the 1928 season, growers in Yugoslavia receiving from 2 to 2.5 cents per pound. This is equivalent to 7 cents to 8 cents on a dried basis, without the cost of drying, using the equivalent of 3.5 pounds of fresh for 1 pound of dried prunes. It is not believed that these prices will prevail under normal crop conditions but with quality satisfactory upon arrival and with the fruit arriving in advance of the big Bohemian crop there is a possibility of greatly extending this outlet.

### Manufacture and export of prune jam

The manufacture of "Pezmez" or prune jam is said to have had its beginning in Bosnia about 1890. It was later taken up by Serbia. Exports since the war have shown a downward tendency due to the import taxes that have been levied in some of the important foreign markets for the protection of their own marmalade and preserve factories. No extensive manufacturing plants are necessary for making plum jam, the cooking taking place in copper kettles often in the open. It takes about 350 pounds of fresh prunes to make 100 pounds of jam or "lequar". It is exported in medium barrels of 110 to 220 pounds or in large barrels of 352 to 440 pounds gross weight. Prices are based on 100 kilograms (220 pounds) net weight. Austria is the largest factor in the importation of Yugoslav prune jam but both Germany and Czechoslovakia are taking increasing quantities. The only other important markets are Hungary, Italy and France. This prune jam is often bought for the purpose of reworking into various marmalade, jam or preserve products. Statistics on exports are given in the table on page 34.

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### Manufacture of slivovica (prune brandy)

Among the few simple wants of the Yugoslav peasants, slivovica, a brandy made from the fermented juice of the prune, is an absolute necessity. This is typically illustrated on market days when peasants on their way to market will be found enjoying a breakfast of a loaf of coarse bread and a bottle of slivovica. It is a national drink and is consumed in large quantities. The prune season is not considered at an end until the needs in this respect are taken care of. The other uses of the prune whether dried, turned into jam or shipped out fresh are entirely secondary to this primary need. Once this is settled ruling market prices determine whether additional quantities of prunes are to be distilled or whether they shall be used for other purposes. Very often the packing plants operate a still in connection with their packing activities to take care of fruit unsuitable for shipping.

Before the war from forty to fifty carloads of slivovica were exported annually to Austria-Hungary from Bosnia alone but high import duties have now practically closed those outlets. It is stated that before the war brandy production in Bosnia amounted to 500 car loads per annum. During the war many of the copper kettles used in distilling this brandy were confiscated by authorities although in 1923 there were still 3,710 of such kettles in use in Bosnia alone. There is no tax on the production of prune brandy in Serbia or Bosnia as long as the brandy is for home consumption. When sold, however, Bosnia levies a tax, so if a peasant receives 12 dinars (21 cents) a liter (about one quart) the tavern will charge 22 dinars (40 cents) a liter, due largely to the tax levied. There is a tendency on the part of authorities in Yugoslavia to urge a reduction in the quantity of prunes going into brandy and using more of the fruit for drying, on the argument that local consumption of prunes in the form of brandy is an economic loss while prune exports bring money into the Kingdom. The habit is so ingrained, however, and the life of the average peasant so simple and unvaried, that no progress has been made in that direction.

### Bag shipments vs. boxes

With only twenty of the Kingdom's thirty-six packing plants in partial operation in 1928, the practise of exporting unprocessed prunes in bags to be packed in the foreign markets is of great concern to the domestic packing industry. America, in this respect, has a point in common with the Yugoslav industry. For some time, the Yugoslav packers have been demanding a heavy export tax on prunes exported for packing in the foreign markets. A rather insignificant export tax of  $2\frac{1}{2}$  dinars (4 cents) per 100 kilograms (220 pounds) or 125 dinars (\$2.20) per carload (22,050 pounds) was allowed in 1927. This tax, however, does not apply to the very small sizes. Moreover it applies only to prunes in bags and not to those in boxes.

It is still too early to determine what the effect of this tax has been on relative exports of bags and boxes although northwestern Germany was far less of an export market in 1927 and 1928 than formerly. Whether

this has been due to the small crops in those years or to the export tax yet remains to be seen. Some Hamburg operators have established plants for packing Yugoslav prunes on the Austrian border for distribution in southern and central Germany thus eliminating the necessity of shipping the prunes in bags to Hamburg. Yugoslav exporters are of the opinion that the tax is too small to exert much influence.

This problem has been further aggravated by the discriminating tariff duties in some foreign markets in favor of prunes in bags. Such discriminatory rates have been instrumental in developing the packing industry in those countries to the detriment of the Yugoslav packing interests, particularly in France, Germany, Austria, Czechoslovakia, Italy and Poland. Attempts on the part of the Yugoslav Government to have these rates reduced have recently been successful in the case of Germany, Austria and Italy. In 1927 about 60 per cent of Yugoslavia's prune exports went out in bags and 40 per cent in boxes; the 1928 exports in bags amounted to 55 per cent and in boxes 45 per cent. With a declining trend in exports the industry is bending every effort to develop the nearby markets demanding the boxed prunes.

#### Transportation facilities

Yugoslavia has available not only rail but excellent water transportation. Frequent and rapid train service through Budapest and Prague means quick delivery of prunes into the markets of northwest Europe. Both the rail and water systems are owned and operated by the Government, so there is no competition. Construction work on new railroad projects is now under progress in many parts of Yugoslavia. The main object of the new construction projects is to secure adequate transportation facilities from the grain belt to the Adriatic. The contemplated construction of standard gauge railway lines into the prune growing areas will greatly facilitate the marketing of fruit since it will eliminate the necessity of transferring the fruit at the border from the narrow gauge to the standard gauge lines. With the completion of more feeder lines the country will have increased access to the large consuming markets by means of the Paris-Vienna, the Budapest-Prague-Berlin and the Constantinople-Athens trunk lines which cut across the country from north to south and from east to west.

In recent years, as much as ninety per cent of the crop has gone by water following the Danube direct to Vienna and Budapest and packing centers on the Austrian border. Goods destined for Hamburg follow the Danube to Czechoslovakia and are there transshipped by rail to the Elbe river. Buyers generally prefer rail shipment as delivery time is much shorter and delays are avoided. Moreover, prunes are not piled as high in railway cars as in the barges, resulting in better deliveries. Eight to ten days are required to deliver prunes to Hamburg by rail compared to three to six weeks by water. The relatively short time required to reach important export markets is a strategic advantage to the prune industry in Yugoslavia particularly when new crop supplies are needed in the fall for early delivery. Exporters in Yugoslavia are well aware of this advantage and comparatively large quantities are sold on the early export market.

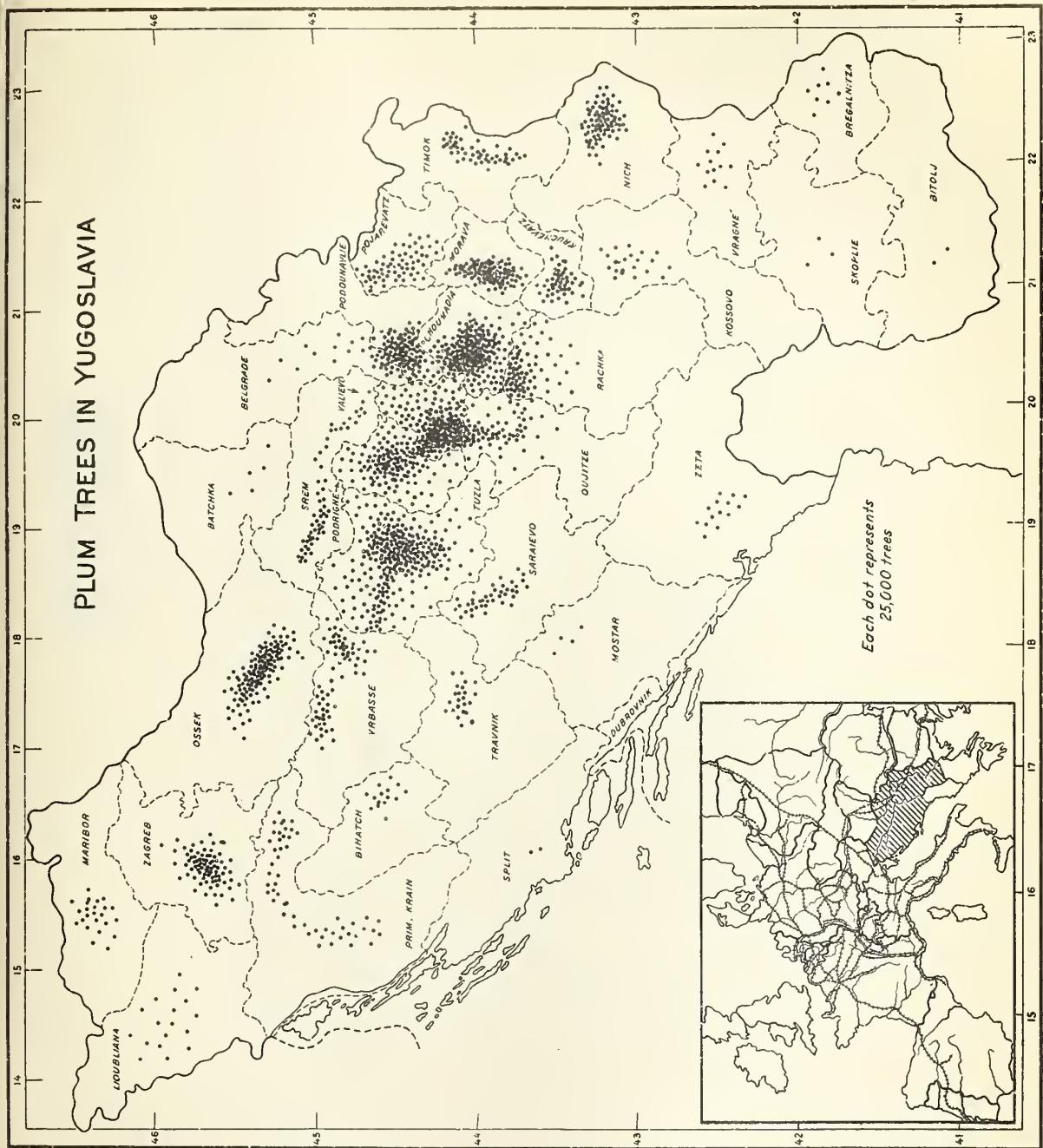
PRUNE AND PRUNE PRODUCTS: Exports from Yugoslavia, average 1920 to 1924,  
annual 1925 to 1928

Destination	Average 1920-1924	1925	1926	1927	1928
	Pounds	Pounds	Pounds	Pounds	Pounds
<u>DRIED PRUNES</u>					
Germany .....	27,339,981	28,754,574	46,451,564	22,401,688	18,628,048
Austria .....	18,379,488	7,254,137	14,016,128	10,534,068	6,095,653
Hungary .....	4,427,767	3,361,382	4,886,196	4,978,187	3,624,830
Czechoslovakia ..	2,421,952	10,340,246	16,916,687	20,882,476	11,980,608
Italy .....	18,061,847	13,127,855	9,316,715	7,028,443	8,906,930
Switzerland .....	5,899,045	5,526,834	3,986,856	1,199,124	1,042,159
Poland .....	893,836	606,944	1,463,235	1,158,588	741,085
Denmark .....	199,048	831,921	794,264	1,166,011	717,965
France .....	2,498,078	2,695,997	2,602,857	869,765	1,628,520
England .....	2,308,759	195,385	122,882	90	-
Holland .....	506,518	2,003,512	1,869,794	263,635	231,836
Greece .....	1,160,210	662,262	490,995	425,256	232,830
Belgium .....	138,537	469,747	489,862	21,762	321,534
All others .....	637,016	320,516	613,392	461,873	166,458
Total .....	82,192,082	76,151,302	104,021,427	71,390,906	53,718,456
<u>FRESH PRUNES</u>					
Austria .....	6,969,873	12,275,400	24,492,833	23,727,316	35,825,846
Czechoslovakia ..	400,252	99,353	313,651	3,311,342	7,924,018
Germany .....	14,195	1,900,092	1,730,097	1,180,323	6,213,293
Hungary .....	56,204	11,920	675,694	313,902	311,186
Greece .....	-	87,293	11,023	32,015	26,647
Italy .....	2,048	7,363	152,018	8,233,407	313,185
Switzerland .....	14,770	15,476	111,233	78,678	989,702
All others .....	2,264	a/ 702,203	-	-	35,150
Total .....	7,428,606	15,099,100	27,486,549	36,876,983	51,639,027
<u>PRUNE JAM</u>					
Austria .....	2,082,498	725,382	1,380,402	1,257,784	1,096,561
Germany .....	355,509	897,010	1,299,135	1,183,180	1,707,315
Czechoslovakia ..	142,766	587,167	5,297,259	917,493	1,126,872
Hungary .....	131,372	217,832	579,047	390,587	263,687
Italy .....	33,417	273	194,344	3,011	26,638
All others .....	79,593	70	22,793	154	2,596
Total .....	2,825,155	2,422,734	6,772,980	3,752,209	4,225,667

Compiled in the Foreign Section, Division of Statistical and Historical Research,  
from "Statistique du Commerce Exterieur" of Yugoslavia.

a/ All to France. No exports of fresh prunes were made direct to France in any  
other year during this period except in 1928 when 25,300 pounds were shipped to  
that market.

PLUM TREES IN YUGOSLAVIA



U. S. DEPARTMENT OF AGRICULTURE

BUREAU OF AGRICULTURAL ECONOMICS

